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PATENT APPLICATION

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Jonathan P. LEWIS-EVANS, et al.

Confirmation No.:

Application No.: 10/776,323

Examiner:

Filing Date: February 12, 2004

Group Art Unit:

Title: WIRELESS COMMUNICATION DEVICE, SYSTEM AND COMMUNICATION METHOD

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CLAIM OF CONVENTION PRIORITY

Sir:

Priority is hereby claimed in the above-identified application based on the following foreign patent application:

✓ Hong Kong (HK) Application No. 03101025.4 filed February 12, 2003

It is respectfully requested that the instant application be accorded the benefit of the filing date of said foreign application pursuant to the provisions of 35 U.S.C. §119.

In support of this claim, a duly certified copy of said foreign application is submitted herewith.

Respectfully submitted,



Sean S. Wooden
Attorney/Agent for Applicant(s)
Reg. No. 43,997

Date: April 13, 2004

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PATENTS ORDINANCE
Chapter 514
Laws of the Hong Kong Special Administrative Region

The attached is a true copy of the Short-term Patent Application No. 03101025.4, which is still pending.

Dated this 16th day of February 2004.

(YIP CHU YING RITA)
Intellectual Property Examiner
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Request for Grant of a Short-Term Patent

Patents Ordinance sections 113, 116, 125
Patents (General) Rules sections 58, 74

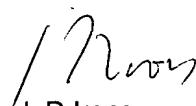
(See the notes on the last page of this form)

01 Your reference		MI-HSP183	
02 Applicant's details (see note (4)(a))		<p>Name (underline surname) Name in Chinese (if applicable)</p> <p>Address</p> <p>Telephone</p> <p>Fax</p> <p>Kind of incorporation Country of incorporation State of incorporation (if applicable)</p>	<p>The Pinpoint Company Limited</p> <p>10/F & 11/F Tianjin Building 167 Connaught Road West Hong Kong</p> <p>2915 2200 3009 8449</p> <p>A limited liability company Hong Kong</p>
03 Title of invention (see note (4)(b))		<p>English</p> <p>WIRELESS COMMUNICATION DEVICE, SYSTEM AND COMMUNICATION METHOD</p> <p>Chinese</p> <p>無線通訊儀器, 系統及通訊方法</p>	

<p>04 Details of International Patent Classification (see note (5))</p> <p>05 Use of micro-organisms (tick the appropriate box)</p> <p>(a) Does the invention require the use of a micro-organism for its performance?</p> <p>(b) If you have ticked "Yes", please indicate whether the micro-organism is available to the public at the date of filing of the application; and whether the micro-organism is described in the application or the specification of the patent in such a manner as to enable the invention to be performed by a person skilled in the art.</p> <p>(c) If you have ticked "No" in both boxes in (b), please give the following details:</p> <p>Name and address of the depositary institution where a culture of the micro-organism is deposited</p> <p>Date of deposit (Day/Month/Year)</p> <p>Accession No. of the deposit</p> <p>(section 73 and Schedule 1, Patents (General) Rules)</p>	<p>IPC Code</p> <p>H04M, H04Q</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Name:</p> <p>Address:</p>	<p>IPC Edition No.</p> <p>7 see (P)</p>
<p>06 Details of international application</p> <p>If the short-term patent application is based on</p> <p>(a) International Application No.</p> <p>(b) International Filing Date (Day/Month/Year)</p> <p>(c) International Publication No.</p> <p>(d) International Publication Date (Day/Month/Year)</p> <p>(e) Date of entry into the national phase in the People's Republic of China</p> <p>or</p> <p>Date of issuance of the National Application Notification by the State Intellectual Property Office</p> <p>(tick the appropriate box and enter the date in the space provided)</p>	<p><input type="checkbox"/> _____ (Day/Month/Year)</p> <p><input type="checkbox"/> _____ (Day/Month/Year)</p>	

<p>(f) Application No. of the Chinese patent application (if known)</p> <p>(section 125, Patents Ordinance and section 78, Patents (General) Rules)</p>									
<p>07 Details of earlier application If the application is divided or derived from an earlier Hong Kong application</p> <p>(a) Section under which an earlier application is claimed (see note (6)) (tick the appropriate box)</p> <p>(b) Earlier Application No.</p> <p>(c) Earlier Application Filing Date (Day/Month/Year)</p>	<p style="text-align: center;">Patents Ordinance</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> section 116 <input type="checkbox"/> section 55 </div>								
<p>08 Details of the priority application If a statement of claim of priority under section 111, Patents Ordinance is made (sections 58(5)(c), 69, Patents (General) Rules)</p>	<p>Statement</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33.33%;">Country</th> <th style="width: 33.33%;">Priority Application No.</th> <th style="width: 33.33%;">Priority Application Filing Date</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Country	Priority Application No.	Priority Application Filing Date			
Country	Priority Application No.	Priority Application Filing Date							
<p>09 Details of inventor (see note (4)(a)) (see note (7))</p> <p>Name (underline surname)</p> <p>Name in Chinese (if applicable)</p> <p>Address</p>	<p>(i) Jonathan P. <u>Lewis-Evans</u> (ii) Michael T. H. <u>Tang</u></p> <p>(i) 10/F & 11/F Tianjin Building (ii) 10/F & 11/F Tianjin Building 167 Connaught Road West 167 Connaught Road West Hong Kong Hong Kong</p>								
<p>10 Non-prejudicial disclosure If the applicant is making a claim regarding non-prejudicial disclosure under section 109, Patents Ordinance, please provide a statement giving details relating to such disclosure. (see note (8))</p>	<p>Statement</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33.33%;">Name and place of the exhibition or meeting</th> <th style="width: 33.33%;">Opening date Of the Exhibition or Meeting</th> <th style="width: 33.33%;">Date of first disclosure</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Name and place of the exhibition or meeting	Opening date Of the Exhibition or Meeting	Date of first disclosure			
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<p>12 Enter the no. of sheets for any of the following documents you are filing with this form</p> <p>(a) Continuation sheet for the request</p> <p>(b) Description</p> <p>(c) Claim(s)</p> <p>(d) Drawing(s)</p> <p>(e) Abstract <i>(in both English and Chinese)</i></p> <p>(f) Priority document(s)</p> <p>(g) Translation of the priority document(s)</p> <p>(h) Search Report</p> <p>(i) Translation of the Search Report</p> <p>(j) In the case of an international application, copy of :</p> <p>(i) the international application as published by the International Bureau</p> <p>(ii) the international search report</p> <p>(iii) translation as published by the State Intellectual Property Office</p> <p>(iv) publication of information by the State Intellectual Property Office concerning the international application</p> <p>(k) Statement of inventorship on Patents Form P7 in accordance with section 113(2)(c), Patents Ordinance and section 65, Patents (General) Rules <i>(see note (7))</i></p> <p>(l) Others <i>(please specify)</i></p>	<p>No. of sheets</p> <p></p> <p>24</p> <p>7</p> <p>7</p> <p>1</p> <p></p> <p>3</p> <p></p>

<p>13 Name of agent (if you have one)</p> <p>Address for service in Hong Kong</p>	<p>Lloyd Wise & Co</p> <p>Room 4005-7, Tower II Lippo Centre 89 Queensway Central Hong Kong</p> <p>Telephone 2526 5654</p> <p>Fax 2868 5438</p> <p>Agent's code (if known)</p>
<p>14 I/We request the Registrar to grant a short-term patent.</p> <p>Signature</p> <p>Name of signatory</p> <p>Official capacity of signatory</p> <p>Date (Day/Month/Year)</p>	 <p>Mark D Irons</p> <p>Patent Attorney</p> <p>12 February 2003</p>

Notes

- (1) *Application on this form should be made in English. (Chinese forms are available if you wish to use Chinese.) The official language in which an application is filed is used as the language of proceedings in all proceedings before the Registrar.*
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 - (b) *section 55, Patents Ordinance for new application filed on court order upon determination of right to patent after grant.*
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Wireless Communication Device, System

and Communication Method

The present invention relates to a mobile communication
5 device adapted for particular but not exclusive use by the elderly or handicapped or vulnerable persons, to a communications system supporting communications through such a mobile device, and to a method of providing voice communication by means of such a system.

10

Amongst the elderly a high proportion of the population worldwide suffers to a greater or lesser extent from a mild form of dementia. According to the Alzheimer's Disease Education and Referral Center of the USA, the
15 proportion is 1 in 50 persons over 65 which climbs to 1 in 5 persons over 80 years of age. This represents a significant proportion of the population which will inevitably increase over the next 15 years as the baby boomer generation attains that age. Persons suffering from
20 mild dementia are frequently active and mobile and therefore able to go out alone but may be at risk from forgetting how to return home or suffering injury or accident. Equally, injury or accident may occur when at home. In such situations it is highly desirable for the
25 person to be able to quickly communicate with someone able to offer assistance.

Whilst a mobile phone or cellular telephone may be appropriate for some situations, the elderly or infirm may often lack the physical dexterity and/or mental acuity to 5 be able to operate small controls and other relatively complex operational procedures of the normal mobile phone which most of us take for granted.

In order to be able to provide assistance to a person in 10 difficulty it is also highly desirable to be able to locate the whereabouts of the user. Various existing technologies are able to locate standard mobile or cellular handsets. The US government has mandated that operators of cellular communications networks are capable 15 of locating to a statutory standard of accuracy a caller using a mobile handset to make an emergency (911 in the US) call and other countries are following or proposing to follow that example. Various systems have also been proposed for locating the whereabouts of a unit which 20 requires no interaction on the part of the person carrying or wearing the unit, such being particularly applicable for children.

The present invention seeks to provide a unit which can be 25 used by an elderly or infirm or handicapped user to allow the user to communicate with someone able to offer or

summon assistance, and to a system supporting communication by means of such a unit, the unit providing a variety of functionalities able to facilitate provision of practical and/or emotional assistance as is needed.

5

According to a first aspect the invention provides a wireless communication device comprising a mobile unit for transmission and reception of voice calls through a mobile phone network having a single user-accessible call activation switch, the unit being programmed to communicate with a first stored telephone number on operation of said call activation switch.

10

Such a structure makes the device very easy for a user, be they a child, or elderly, or infirm or handicapped in some way, to operate.

15

The device preferably also includes location determination means, in the preferred embodiment utilizing signals from the mobile network, such as a GSM network. Alternatively, or additionally, the device may include a GPS unit. The information indicative of the device location may be transmitted to a second stored number on operation of the call activation switch, but may also be transmitted in response to a received request from an authorised source.

20

25 The information relating to device location is

transmitted as a burst type message such as an SMS message. The second stored number is used to send the location information to a server which processes this for display.

5

The device may be programmed such that if operation of the call activation switch does not result in connection of a call to the first stored number, the unit can re-dial a predetermined number of times until a connection is made.

10 Subsequent to connection of the call to the first stored number any second or subsequent operation of the call activation switch occurring within a predetermined time since a first operation of said switch is ignored. After disconnection by the other party the unit automatically 15 disconnects after a predetermined period unless the user of the device has since operated the call button to disconnect.

20 The device may also include a volume control button or buttons operable to adjust the volume of received voice call only when a call is connected to the unit.

25 Battery charge detection means may be provided wherein the device is programmed to send a message to a third stored phone number in the event that a battery charge level falls below a preset value. The internal settings of the

unit may be remotely controllable by means of SMS messages sent from an authorised entity.

5 In a further aspect the invention resides in a communication system comprising at least one mobile device comprising a mobile unit for transmission and reception of voice calls and having a call activation switch, the device being programmable to call a predetermined number or numbers on operation of the switch; and at least one 10 call processing centre associated with such predetermined telephone number or numbers at which a human operator receives calls from the device and initiates calls to the device through a mobile communication network.

15 In a preferred embodiment the mobile device comprises location determining means and is programmed to send information relating to the device location to said call processing centre on operation of the call activation switch. The mobile device may comprise location 20 determining means and sends information relating to the device to said call processing centre in reply to a location request command sent from said call processing centre. The call processing centre may display the mobile device location on a secure website accessible to 25 authorised contacts.

The call processing centre may include data storage means
storing data comprising personal information relating to
the mobile device user. Moreover, the call processing
centre may re-direct calls from or to a mobile device to
5 or from an authorised contact.

Fundamental to the practical success or otherwise of such
a device is that users must remember to carry it with them
when they leave the home. In this respect a mobile phone
10 is wholly inadequate.

A reaction to the inconveniences of forgetfulness is to
simplify the user's life to minimise the opportunities for
forgetting and to create positive, reinforcing habits to
15 obviate the occasions of forgetting such as taking the
same things with them whenever they go out. Research
shows that the most frequent items selected for
reinforcing habit creation when leaving the home are the
wallet or purse and keys.

20
In a still further aspect the invention resides in a
portable communication device comprising a housing
enclosing a transceiver unit for transmission and
reception of voice calls through a mobile phone network,
25 and a receptacle for containing small personal effects,
wherein the housing and receptacle are integrated into a

single device. The receptacle may be a wallet suitable for containing one or more of notes, coins, credit cards, identification cards or the like, or may be a key fob for holding one or more door keys.

5

In a still further aspect the invention resides in a method of communication between a mobile electronic device having a transceiver for transmission and reception of voice signals via a mobile phone network and including data storage means, and a call processing centre, the device having a single user-accessible dial button associated with a call activation switch, the method comprising the step of retrieving, in response to activation of the call switch by the user, a stored telephone number associated with said call processing centre from said storage means, and dialling said stored telephone number to open voice communication therewith.

10 The device may have location detecting means, the method then involving measuring one or more position dependent criteria and sending data representative thereof to a second stored telephone number. The position dependent criteria may comprise one or more properties of signals associated with the mobile phone network. Alternatively, 15 the criteria may comprise properties of signals associated with a GPS system.

The data representative of device position is supplied for display on a website together with stored map image data. The method may also involve onward connection of a voice 5 call from the device to a stored telephone number on to a further authorised contact, or the onward connection of a call from an authorised contact to the call processing centre on to the device.

10 In a further aspect the invention resides in a combination of the device as defined above and a charging cradle comprising a main body defining a well having a pair of electrical contacts at the bottom of the well for contacting complementary contacts on the device, and an 15 upstanding rear wall and a side wall upstanding from the main body to facilitate the guiding of the device into the cradle. This allows the device to be charged easily by opening the protective flap and inserting the device into the charging cradle with the wallet or purse still 20 attached.

Embodiments of the invention are now described, by way of example only, with reference to the following drawings in which:

25

Figure 1 is a schematic overview of a communication and

location system in accordance with one aspect of the invention;

Figure 2 is an external view of a wireless communication device in accordance with a further aspect of the invention with a flap in an open position;

Figure 3 is an external view of the device of Figure 2 with the flap in a closed position;

Figure 4 is an underside view of the device of Figure 2 with a wallet part removed;

Figure 5 is a front perspective view of a charger;

Figure 6 shows the device being fitted into the charger;

Figure 7 is a schematic view of the electronic components of the portable communication device;

Figure 8 is a logic diagram indicating the main operational steps in activation and use of the device by a user;

Figure 9 is a logic diagram indicating the main operational steps involved in providing location information; and

Figure 10 is a logic diagram indicating the main operational steps on a call initiated by a call centre.

The invention in one aspect concerns a wireless portable device allowing a user to communicate by voice with a predetermined location. The device and the communication system of which it forms a part are discussed in relation

to a specific application, namely a device for use by the elderly or handicapped or by vulnerable persons who are mobile and yet have a need to keep in voice communication with someone providing a caring function, hereafter referred to as "a carer", but who for some reason such as mental impairment, or limited manual dexterity are unable to use a conventional mobile phone. Note however that the device and system have much wider applicability, for example with children, or where for some other reason use of a mobile phone with its associated complexity is not desired or appropriate. Whilst in many respects the device is very similar to a mobile or cellular phone and has many components in common herewith, externally and operationally it is significantly different.

15

An overview of the communications system in accordance with an embodiment of the invention is shown schematically in Figure 1. The wireless portable communication device to be carried by the user is indicated 2. The device incorporates a transceiver for sending and receiving telephone calls and other data to and from a call centre 100 in a wireless manner via a mobile telecommunication network 102.

25

Calls received from the device at the call centre 100 may be forwarded to another authorised party such as someone

having responsibility for caring for the user such as relative or doctor. Equally, calls from such an authorised party may be forwarded by the call centre 100 to the user.

5

The mobile network of any particular network operator may obviously be configured in a variety of ways, and in passing telephone calls to the call centre may equally make use of line based public switched telephone network 10 (PSTN). Calls are routed through a service provider 104 who is able to provide to the call centre 100 a variety of additional information and services as discussed in more detail below, for example to provide information about the location of the device and to provide information specific 15 to the user such as medical records, details of doctors or medications stored on data storage servers 106. Such location or other information can also be provided in real time to an authorised party via a website 108 and displayed through a web browser on a computer device 110 20 of the authorised party.

Although the system configuration shows the network operators, service provider and call centre as separate entities, as is the most likely commercial scenario, it 25 will be appreciated that many other alternatives are readily possible. For example, the service provider and

call centre may be the same entity running the various applications on different servers or even on the same appropriately partitioned servers. Alternatively, the network operator might themselves also act as a service provider, and even as a call centre.

As can be seen in Figures 2 and 3 the device 2 comprises a housing 4 formed of rigid plastics material and providing at least a splashproof protection of its internal components. The housing 4 has a main body 6 and pivotably movable flap 8 which can be opened out to reveal or closed to conceal the control buttons.

The control buttons include a call button 10 and a pair of volume buttons 12, 14 for respectively raising or lowering the audible volume level of voice calls. It will be noted that these are the only user accessible controls. Each of these are membrane-type push buttons, with a tactile click that is felt by the user. Each of the buttons may have surface relief whereby the buttons can be readily identified by the blind or partially sighted. The call button will be provided with graphics or printing of a bright colour contrasting with the rest of the housing. The presence of a single prominent and easily accessible and identifiable call button 10 is highly significant in ensuring that there is no possibility of confusion on the

part of the user as to how to operate the device. The movable flap 8 when closed serves to prevent accidental pressing of the control buttons. The front of the main body 6 includes a shaped opening 16 beneath which a 5 speaker is arranged. Located adjacent to call button 10 is a charge indicator light 22. A reset button is provided on the rear of the device.

The device is secured to a receptacle which in the 10 illustrated embodiment is a wallet or purse 24, but might equally be a key fob for holding door keys. The wallet illustrated has one or more pockets 26 for containing items such as an ID card, credit cards, notes, coins and the like. The incorporation or integration of the 15 electronic unit into an item such as wallet or purse which would habitually be carried when leaving home is important for ensuring that users, even those of impaired metal acuity, remember to take the device with them. Furthermore, such integration means the user is not 20 bothered by having to take out and take care of an additional item.

Figure 7 shows in schematic form the electronic components. Largely, the electronic components are similar to those of a mobile or cellular phone. The 25 described embodiment is intended to operate in a GSM (Global System for Mobile Communication) mobile

communications network, but as will be discussed in more detail below the device may be configured for various other environments as the skilled person will readily appreciate. The Siemens MC35 cellular engine is particularly appropriate for providing the desired functionality as hereinafter described. The device includes a SIM (Subscriber Identity Mobile) card 33. A control processor 34 embodied on a control chip and associated electronics serves to control the device according to a set of programmed instructions. Power is provided by a rechargeable battery 36 such as a polymer lithium ion type. The device also includes a speaker 38 and microphone 40. It will be noted that the MC35 cellular engine incorporates various feedback suppression circuitry which is especially useful in a device of such small size where the speaker and microphone are closely located, and it is not intended that an earphone should be used. The user accessible call button 10 is shown, depression of which activates a call activation switch and hence the call sequence. A buzzer 42 provides a ring tone to indicate an incoming call, whilst a vibrator 44 provides a vibratory indication of an incoming call. Connected to the modem is the battery indicator 22 which includes a multicolour LED (light emitting diode), including a green LED indicating a charge level above a predetermined percentage value, an amber LED indicating

the device is undergoing a charging operation, and a red LED indicating a low charge, for example at 40% or less of full charge. Also connected to the modem is a network indicating LED 46 which indicates that a network signal strength above a predetermined value is detected. This LED 46 is generally hidden from normal view of the user beneath a removable rear panel so as not to unnecessarily complicate the device for the user, and is used in checking and maintenance of the device.

10

The device 2 also provides location determining functions, which although not essential to the invention in its broadest aspect are highly desirable. The possible hardware therefor is not described in detail as various proprietary chips and systems are available as the skilled person will well understand. In the specific embodiment described the Siemens MC35 modem has such location determining functionality built in. Briefly, in the GSM environment the system employs an enhanced cell triangulation using an NMR (network measurement report) technique. Such a technique employs a detection of signal intensity from a base station of a primary cell in which the device is located and from a number of other more distant cells. In various known techniques this intensity information is sent to the mobile network server for further processing to yield an x, y position, as is well

25

known to those skilled in the art.

In contrast to most phones, the device is recharged using a charging cradle 48 as shown in Figures 5 and 6. The 5 charging cradle 48 has a particular construction to allow the device 2 to be very easily inserted into the cradle 48. More particularly, the charging cradle includes a housing having a main base or body 50 of substantial dimension defining an upwardly facing shallow well 52 and 10 having a vertically extending rear wall portion 54 of substantial height and a sidewall portion 56. At the opposite end (left hand end in the figures) the well 52 is open so that when the device 2 is inserted the flap 8 and wallet 24 can be extended therethrough. The distance between 15 the front edge of the well 52 and the back wall 54 is chosen so that device can only be inserted with the flap 8 in an open position. This ensures that the call button 10 remains readily accessible, in the event of an emergency. The base of the well 52 includes a pair of protruding 20 sprung metal contacts 58 which engage metal contacts 60 on the lower edge of the device 2, as can be seen in Figure 4. The charging cradle 48 is connected to a mains power supply through a power adapter 62 providing dc voltage of about 6 to 8V. The use of such a charging cradle avoids 25 the need for the user to have to fit any kind of plug or pin into a charging socket as is conventionally used in

mobile phones, such an operation being particularly problematic for those of limited manual dexterity. Instead, even a user of limited manual dexterity can engage the device 2 with the extended back wall 54 and 5 then the end wall 56 and push or even drop the device into the well in the correct position for proper electrical contact.

The operation of the device 2 will now be described, 10 firstly with reference to figure 8. When the user wishes to make a call he or she opens the flap 8 and presses the call button 10 (step 200). The software program running on the control chips instructs the modem of the cellular engine 30 to retrieve from the SIM card 33 the phone 15 number of the call centre 100 stored therein (step 202).

A dial retry scheme in the event that the call to the call centre 100 is not immediately connected is also read from the SIM card 33 (step 202). The retrieved number is 20 dialled and the voice call attempted (step 204). Assuming the call is answered by the call centre operator (step 206), the operator is then able to talk to the user to provide assistance in whichever way is appropriate for the particular circumstance. If the call is not connected, 25 the modem waits for the predetermined retry period (step 208) and redials, according to the retry scheme retrieved

by the software program from the SIM card.

Once the call is finished the user can disconnect by
pressing the call button 10 again (step 210). However, in
5 the event that the call button is pushed within a
predetermined period from the start of the call, typically
set at about 4 seconds, the call remains connected (steps
214,206). This feature means that if a user perhaps with
limited manual dexterity inadvertently presses the button
10 twice or more in rapid succession, the call is not
disconnected.

In the event that the called party hangs up first (step
216), the user can disconnect the device themselves within
15 a predetermined time by pressing the call button (step
218,220), typically a 4 second period, but if they do not
do so, the software program instructs the modem to
automatically disconnect (step 222).

20 It is also possible for calls to be made to the device
from the call centre ("pull type"), as explained in
relation to Figure 10. The call centre calls the phone
number accorded to the device (step 230). The device will
check (step 234) that the call comes from an authorised
25 phone number retrieved from the SIM card (step 232) and
assuming it does, will commence the ringing of the buzzer

and vibrator (step 236). If it does not, the call may be rejected (step 238). The user may answer the call by pressing the call button (step 240), in which case the call is established (step 206).

5

If the user does not answer the call, after a predetermined period the call is automatically connected. This function is especially useful in an emergency situation, for example if an elderly person has had a fall in the home, allowing the call centre to listen in on the user. Following establishment of the call (step 206), the same functionalities to prevent unintended disconnection and providing automatic disconnection (steps 210 to 222 of Figure 8) are provided.

10

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In addition to establishing voice calls to and from the device and call centre, it is equally possible for the call centre to forward a received call from the device to an authorised contact, such as a relative or other carer, or to forward a retrieved call from a relative or other carer to the device.

20

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As discussed above, in addition to providing voice communication, the device may also provide location information, which although not essential is highly desirable. Turning to Figures 8 and 9, each time the user

presses the call button 10 (step 200), the software program instructs the modem to read a phone number from the SIM card to which location-related information is to be sent (step 250). The precise nature of this information will vary according to the mobile network type and location scheme employed. For example, in a GSM network, the information will typically be representative of intensities of network signals from a number of different network cells. This information is incorporated within a data burst type message such as an SMS (short message service) message as is well-known and defined by various industry standards and sent to the location server at the service provider or network operator (step 252). It may be arranged that a return acknowledge message, usually 15 also a SMS message, is required (step 254); otherwise, the location SMS message is sent again until a receipt message is received. Figure 9 shows the location determination steps in further detail. As noted above the location information to be collected from the device will depend on the mobile network type and location technique employed, or whether some non-network technique such as GPS or rf (radio frequency) position finding is employed. Note also that depending on the precise system employed, the location information may be processed within the device 20 itself to yield an x, y position (step 254) in which case no further processing is required. However, more usually, 25

part of the processing is required to be carried out in the service provider server or network server to yield an x, y position from the detected criteria (step 258). As indicated schematically in Figure 1, the service provider 5 may store relevant map information and provide this along with the user's x, y position to a website 108 on a webserver, from where it can be accessed and displayed to the call centre 100 operator, and to other authorised contacts such as relatives, health professionals or 10 emergency services. The automatic dispatch of the location information to the service provider each time a call is made irrespective of whether it is specifically needed, means that the location information can be available to the operator very rapidly if it is needed 15 without the operator having to initiate any location request. This location information may be extremely important to the operator in their conversation with the user. For example, if the user is away from home and lost or disorientated, the operator may be able to immediately 20 guide the user to a familiar place or to somewhere or someone who can provide physical assistance.

It is also possible for the call centre 100 to initiate a 25 location request ("pull type"), as is illustrated in the top right hand side of Figure 9. In this case the call centre issues a location request (step 260), sent as a

burst type message such as an SMS message to the device (step 262). Thereafter the device responds to the request in a similar manner as a push-type request.

5 The device is accorded various additional functionalities many of which are found in mobile phones, and various of which are not. However, in contrast to a conventional mobile phone, the device does not include user-accessible controls, but rather employs remote "over the air" 10 initiation from the call centre of various control commands stored in and executable by the processor.

More particularly two types of commands can be used with the device. Firstly, programming of the SIM card is used 15 to set the initial operating parameters of the device and to program numbers to which voice calls and messages are sent and from which voice calls can be received. Secondly, control commands are used to request a response or change the mode of the device. The processor stores preferably as 20 SMS strings on the SIM card the various programming commands initiatable in response to SMS messages from the call centre or other authorised entity. For security purposes all command messages must be preceded by a password. The programming commands may include for 25 example:

Set number and retry scheme for outgoing calls
Set number to validate for incoming calls
Set number and retry scheme to send location information
Set location information format

5 Set number and retry scheme to send low battery alert
Set low battery format
Change password
Change ringer volume
Change vibrator status

10 Read messages
Delete messages
Disconnect call
Call acknowledge

15 The device includes various particular functions associated with maintaining the battery charge. As described previously, the device includes a green, amber and red LED activated by a circuit according to detection of sufficient charge and a low charge level (for example at 40% of full charge). In addition however, the control processor is programmed to automatically send an SMS message when the low battery condition is detected to the call centre or to any other authorised contact, relative or carer. In response thereto, the call centre operator or authorised contact may then call the user to remind the user to place the device on the charging cradle.

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It will be understood that the device allows a user to be given constant assistance wherever they are, either re-assurance or emotional or practical assistance. The device
5 is extremely simple for the user to operate yet maintains sophisticated device management and support functions controllable automatically or remotely.

Claims:

1. A wireless communication device comprising a mobile unit for transmission and reception of voice calls through a mobile phone network having a single user-accessible call activation switch, the unit being programmed to communicate with a first stored telephone number, on operation of said call activation switch.
2. A device according to claim 1 further comprising location determination means.
3. A device according to claim 2 wherein the location determination means comprises means for location determination based on signals from the mobile phone network.
4. A device according to claim 2 wherein the location determination means comprises a GPS unit.
5. A device according to any one of claim 2 to 4 wherein the information relating to the device location is transmitted to a second stored number on operation of the call activation switch.
6. A device according to any one of claims 2 to 4 wherein information relating to device location is transmitted to the second stored number in response to a received request from an authorised source.

7. A device according to claim 5 or 6 wherein the information relating to the device location is transmitted as an SMS message.
- 5 8. A device according to any one of claims 5 to 7 wherein the second stored number represents computer means, by means of which said location information can be displayed to an operator.
- 10 9. A device according to any preceding claim wherein, if operation of the call activation switch does not result in connection of a call to the first stored number, the unit re-dials until a connection is made.
- 15 10. A device according to any preceding claim wherein subsequent to connection of the call to the first stored number any second or subsequent operation of the call activation switch occurring within a predetermined time since a first operation of said switch is ignored.
- 20 11. A device according to any preceding claim wherein, after disconnection by the other party the unit automatically disconnects after a predetermined period unless the user of the device has since operated the call button to disconnect.
- 25 12. A device according to any preceding claim further comprising a volume control button or buttons operable to adjust the volume of received voice call only when a call is connected to the unit.

13. A device according to any preceding claim further comprising battery charge detection means wherein the device is adapted to send a message to a third stored phone number in the event that a battery charge level falls below a preset value.
5
14. A device according to any preceding claim wherein internal settings of the unit are remotely controllable by means of SMS messages sent from an authorised entity.
- 10 15. A communication system comprising:
at least one mobile device comprising a mobile unit for transmission and reception of voice calls and having a call activation switch, the device being programmable to call a predetermined number or numbers on operation of the switch;
15 at least one call processing centre associated with said predetermined telephone number or numbers at which a human operator receives calls from the device and initiates calls to the device through a mobile communication network.
20
16. A communication system according to claim 15 wherein the mobile device comprises location determining means and is programmed to send information relating to the device location to said call processing centre on operation of the call activation switch.
25
17. A communication system according to claim 15 or 16

wherein the mobile device comprises location determining means and sends information relating to the device to said call processing centre in reply to a location request command sent from said call processing centre.

5

18. A communication system according to claim 16 to 17 wherein the call processing centre displays the mobile device location on a website accessible to authorised contacts.
- 10 19. A communication system according to any one of claims 15 to 18 wherein the call processing centre includes data storage means storing data comprising personal information relating to the mobile device user.
- 15 20. A communication system according to any one of claims 15 to 19 wherein the call processing centre may redirect calls from or to a mobile device to or from an authorised contact.
- 20 21. A portable communication device comprising a housing enclosing a transceiver unit for transmission and reception of voice calls through a mobile phone network, and a receptacle for containing small personal effects, wherein the housing and receptacle are integrated into a single device.
- 25 22. A portable communication device according to claim 21 wherein the receptacle is a wallet suitable for containing one or more of notes, coins, credit cards,

identification cards or the like.

23. A portable communication device according to claim 21 wherein the receptacle is a key fob for holding one or more door keys.

5 24. A method of communication between a mobile electronic device having a transceiver for transmission and reception of voice signals via a mobile phone network and including data storage means and a call processing centre, the device having a single user accessible dial button associated with a call activation switch, the method comprising the step of, retrieving in response to activation of the call switch by the user, a stored telephone number associated with said call processing centre from said storage means, and dialling said stored telephone numbers to open voice communication therewith.

15 25. A method according to claim 24 wherein the device has location detecting means, the method involving measuring one or more location dependent criteria and sending data representative thereof to a second stored telephone number.

20 26. A method according to claim 25 wherein said location dependent criteria comprise one or more properties of signals associated with the mobile phone network.

25 27. A method according to claim 25 wherein said location dependent criteria comprises properties of signals

associated with the GPS system.

28. A method according to any one of claims 24 to 27 wherein the data representative of device location is supplied for display on a website together with stored map image data.
29. A method according to any one of claims 24 to 28 further comprising the step of onward connection of a voice call from the device to a stored telephone number on to a further authorised contact.
- 10 30. A method according to any one of claims 24 to 28 further comprising the steps of onward connection of a call from an authorised contact to the call processing centre on to the device.
- 15 31. A device according to any one of claims 1 to 14 in combination with a charging cradle, the cradle comprising a main body defining a well having a pair of electrical contacts at the bottom of the well for contacting complementary contents on the device, and an upstanding rear wall and a side wall upstanding from the main body to facilitate the guiding of the device into the cradle.
- 20 32. A combination according to claim 31 wherein a side of the well opposite to said side wall is open.
33. A combination according to claim 31 or 32 wherein the device is provided with a movable flap which when closed covers a portion of the front of the unit and

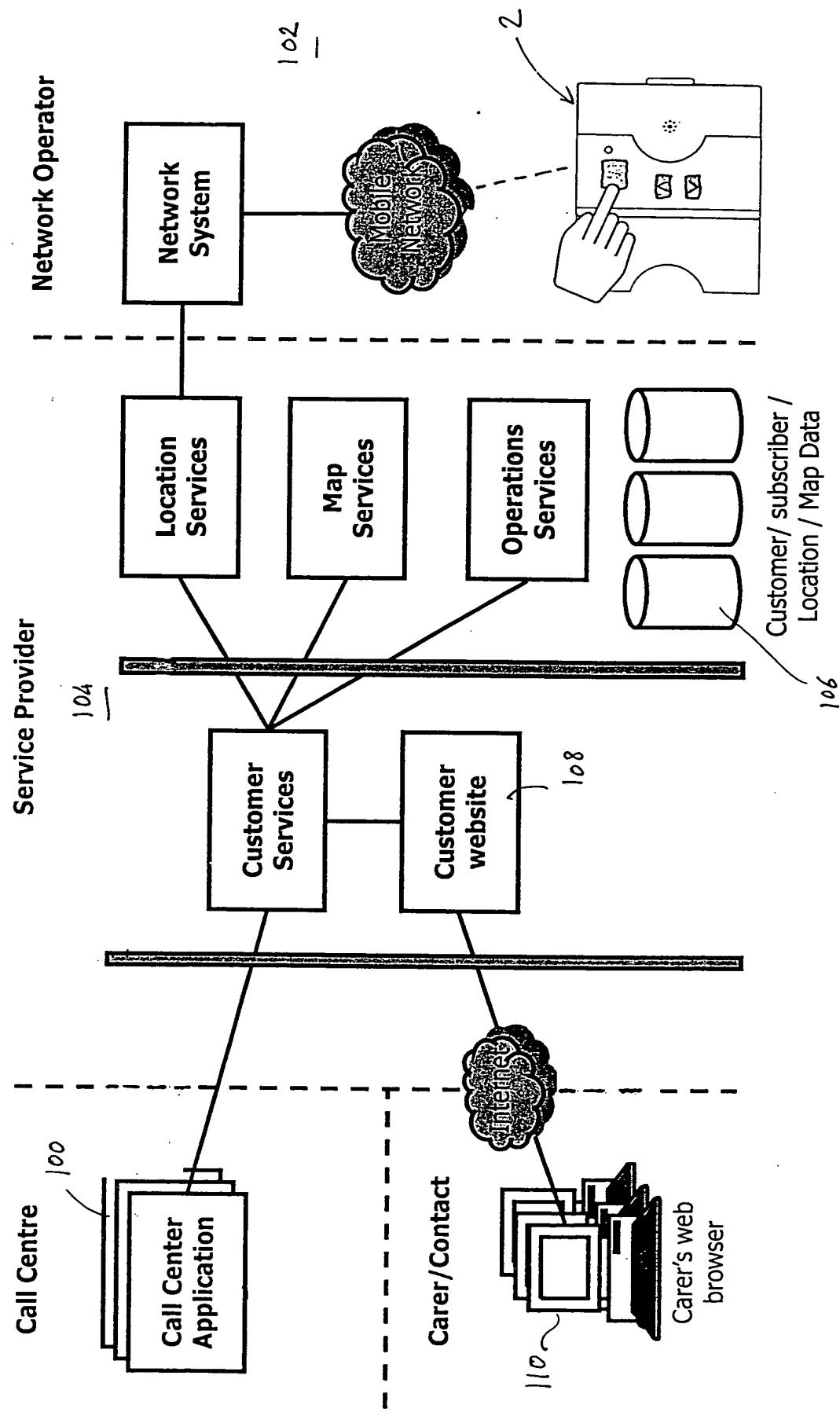
covers a call activation switch, the well being dimensioned so that the device may be inserted therein only with the flap in an open position.

Abstract

Wireless Communication Device, System
and Communication Method

5 A wireless communication device (2) comprises a mobile unit for transmission and reception of voice calls through a mobile phone network having a single user-accessible dial button (10) controlling a call activation switch, the unit being programmed to communicate with a first stored
10 telephone number, on operation of said call activation switch, the unit being integrated with a receptacle for personal effects such as a wallet or purse (24).

Figure 1



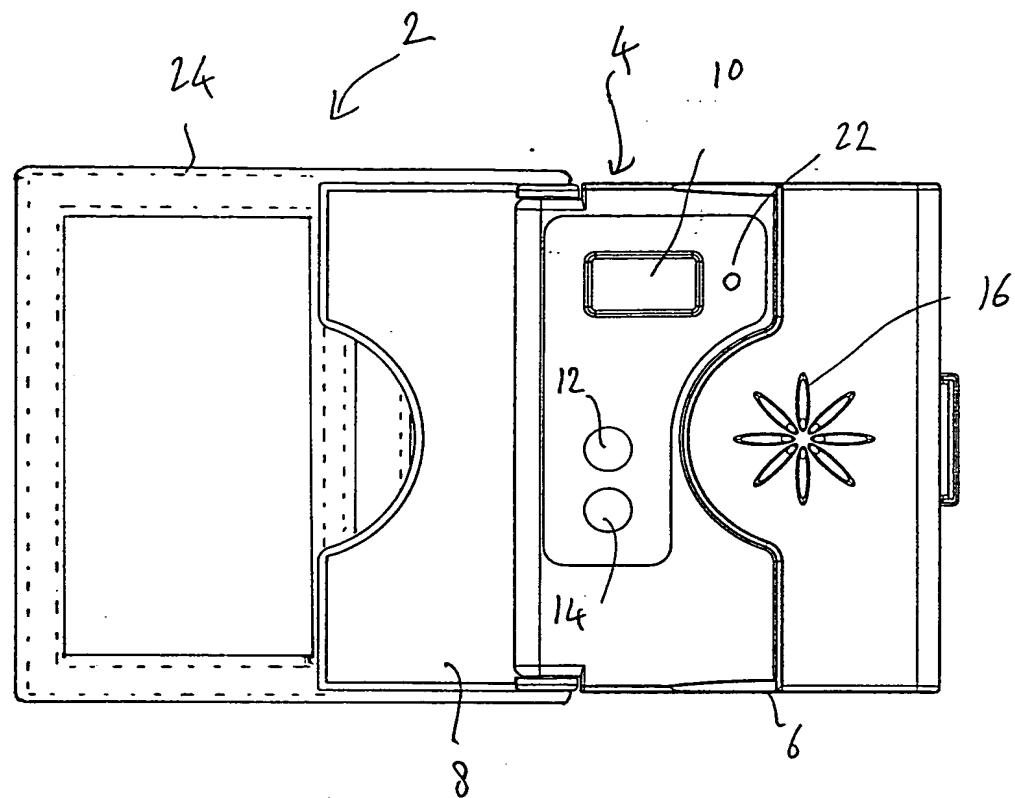


Fig.2

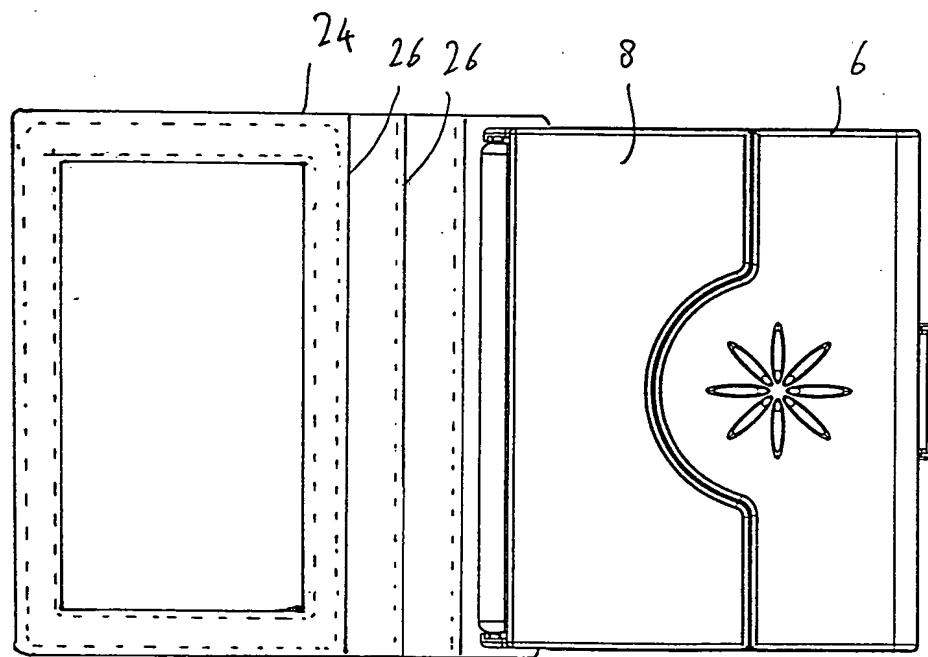


Fig.3

Fig.4

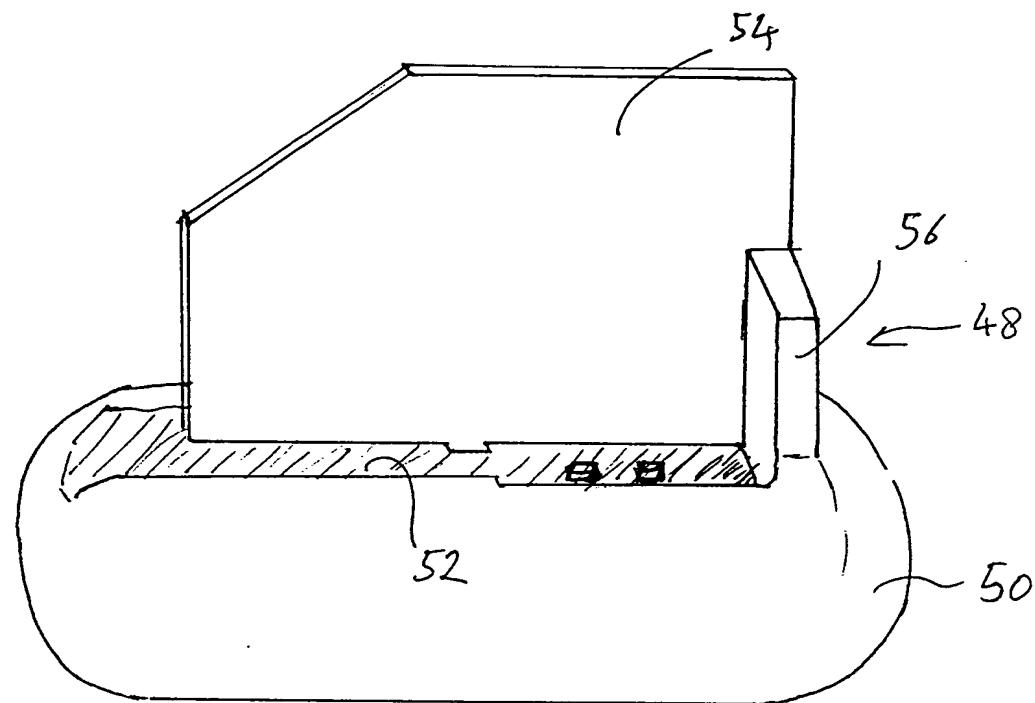
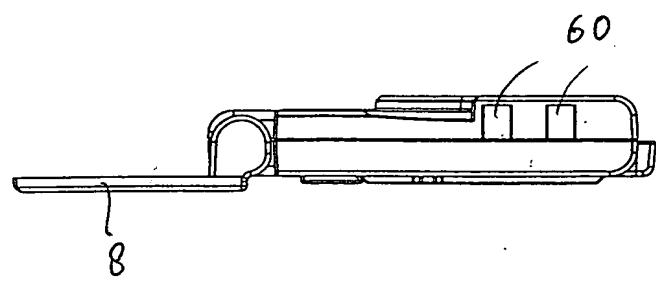


Fig.5

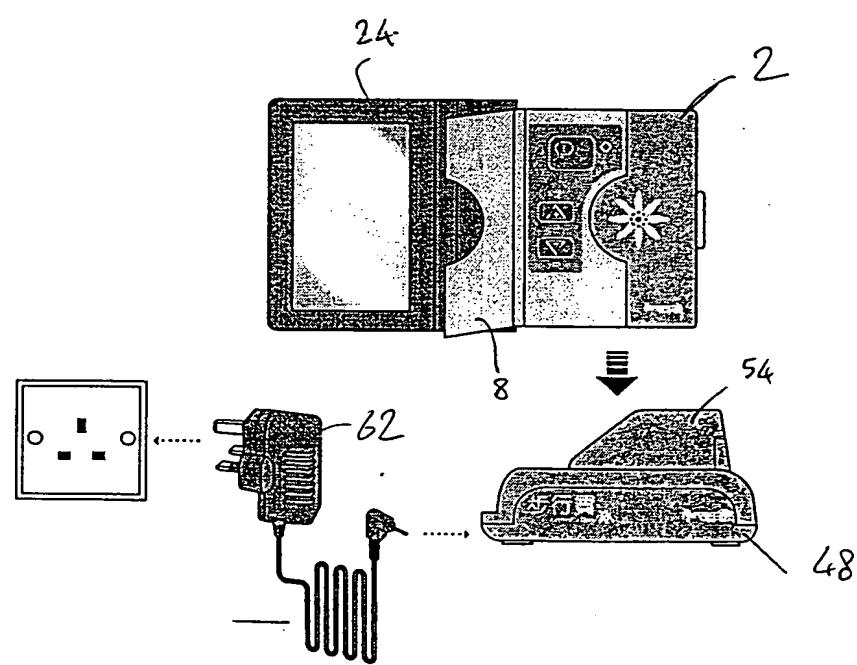


Fig.6

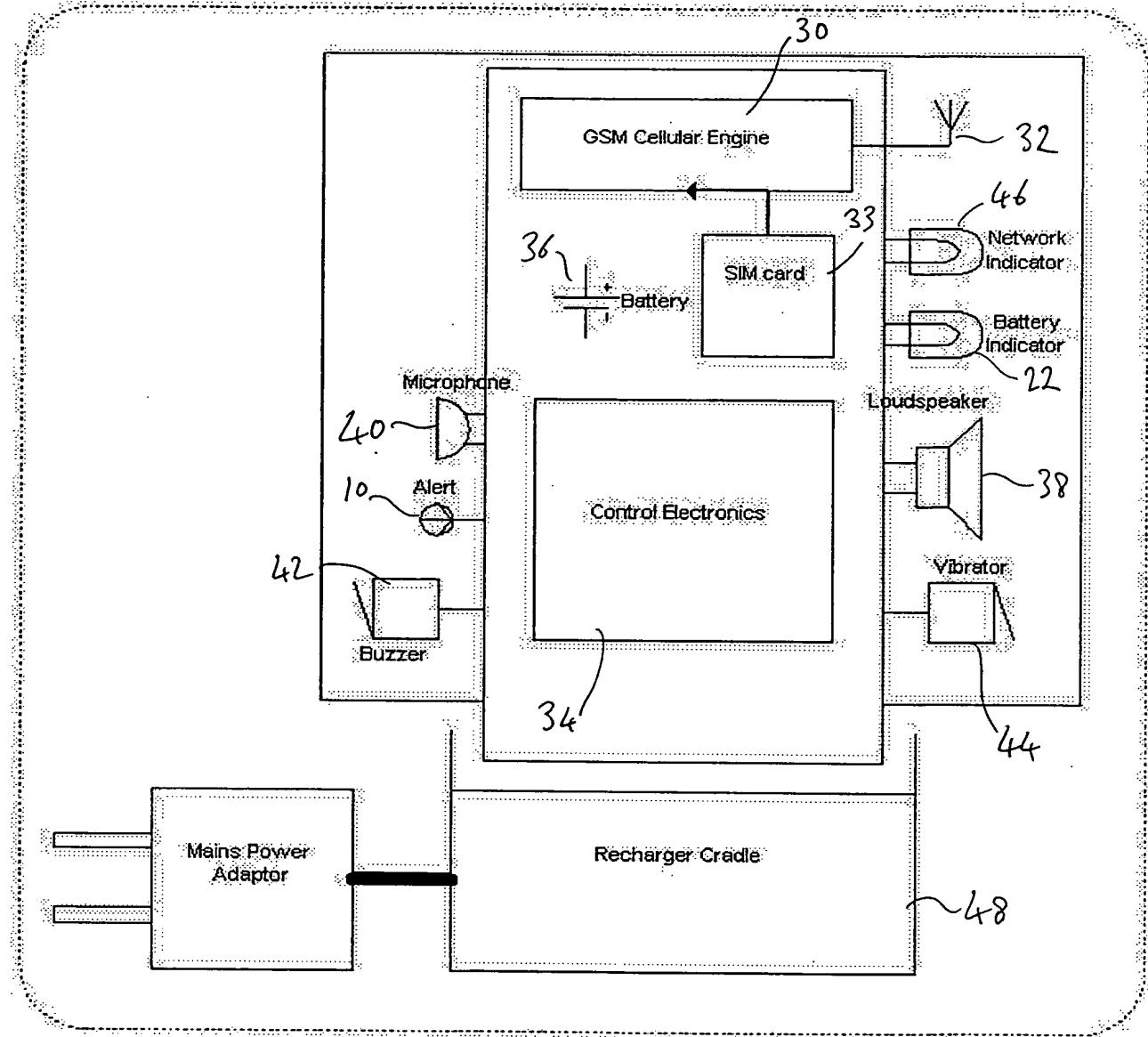


Fig.7

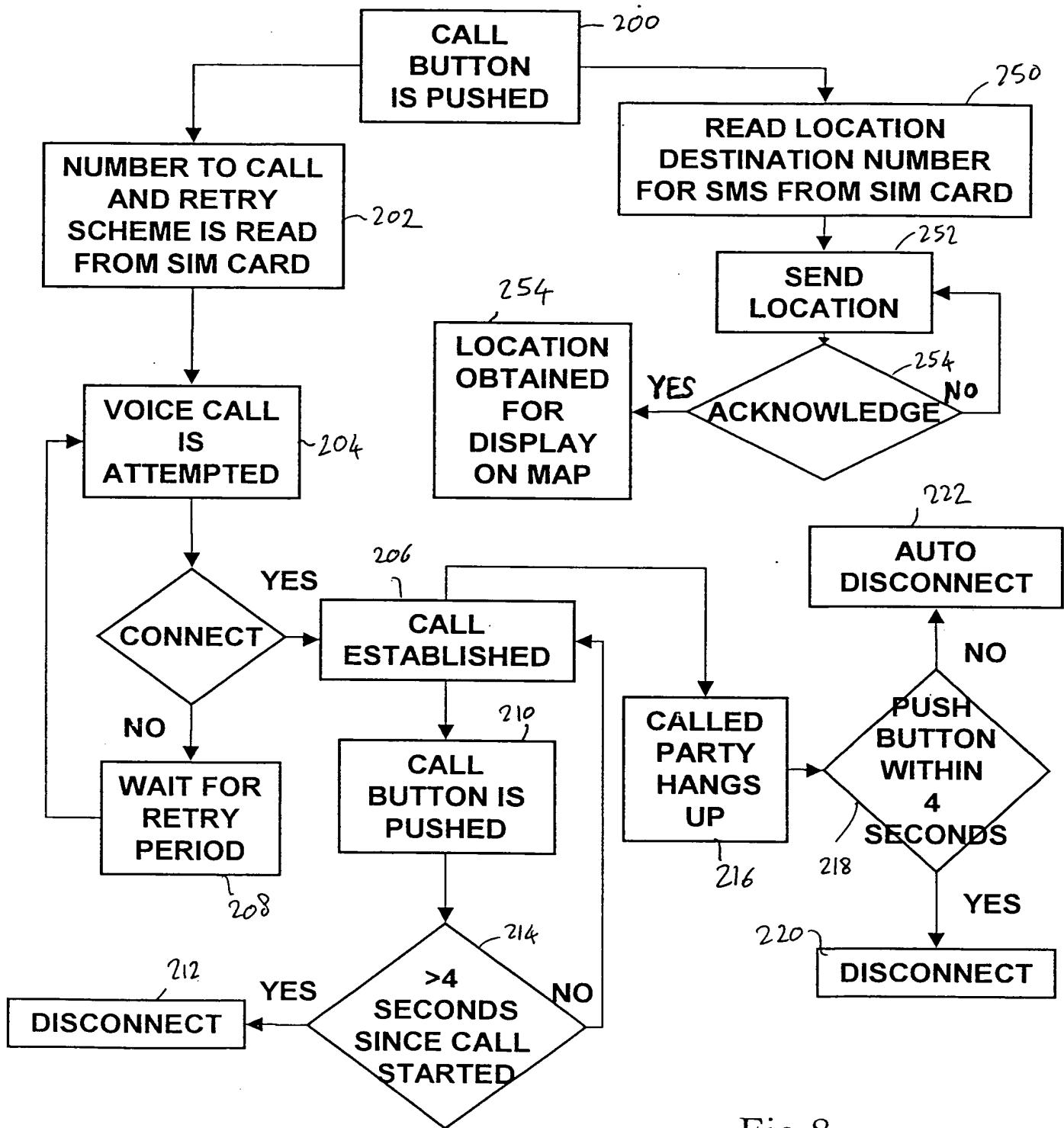


Fig.8

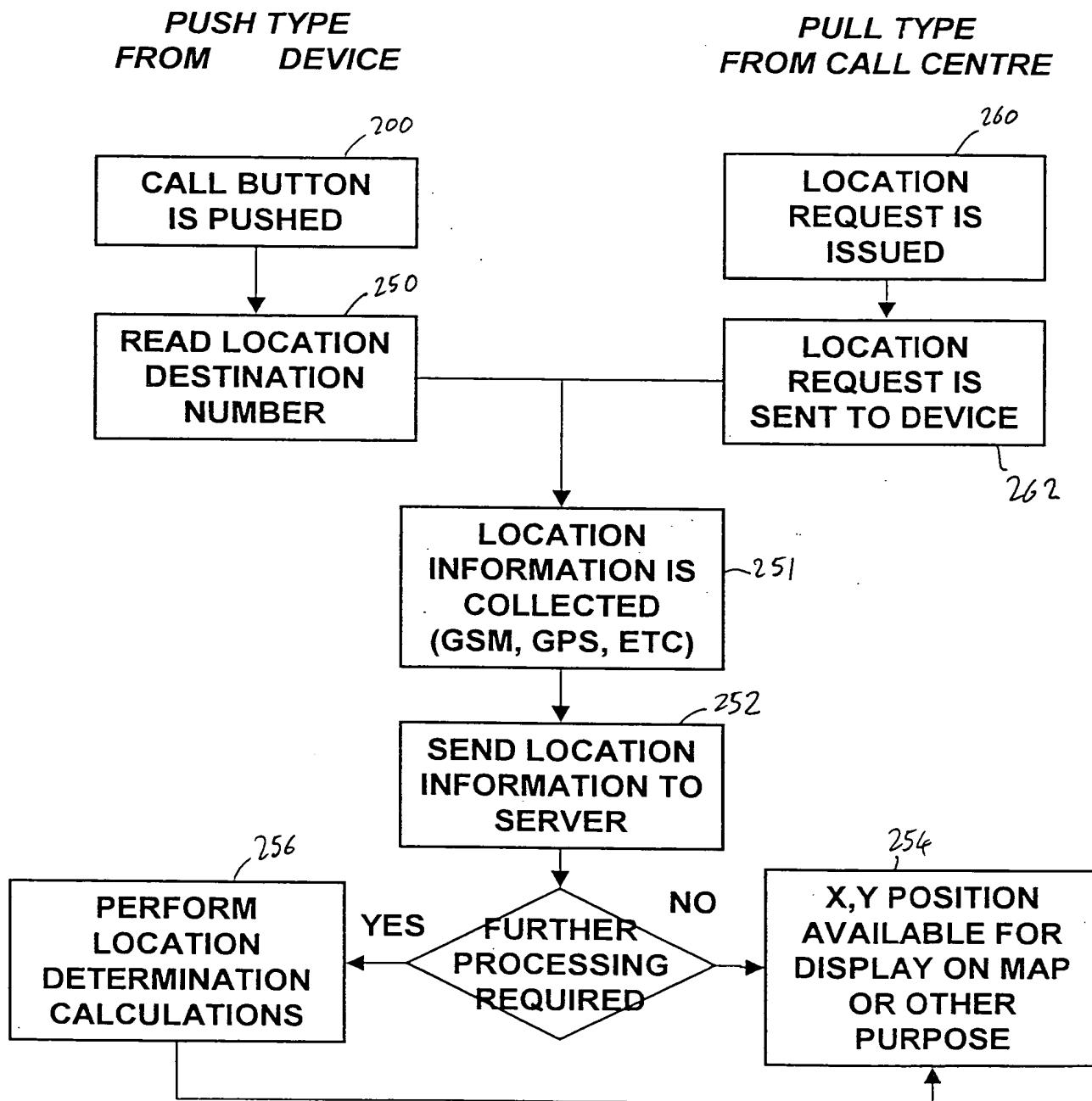


Fig.9

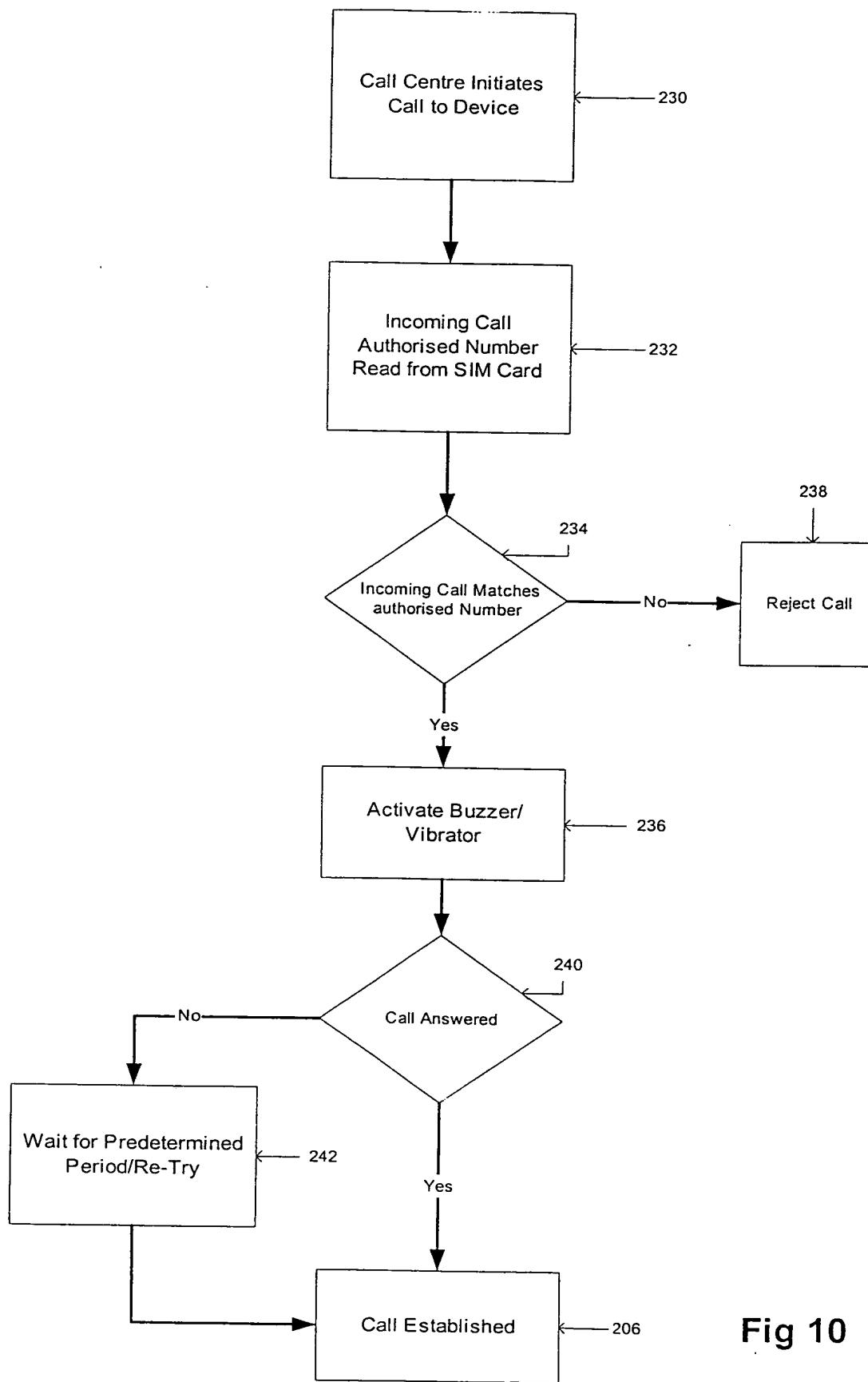


Fig 10